

THAT WHICH IS CLAIMED IS:

1. A method of introducing a substance into an avian egg, comprising:

applying a sanitizing fluid to the shell of the egg to kill pathogens attached thereto;

5 forming an opening in the shell;

inserting an injection device through the opening and into an interior portion of the egg, wherein the injection device comprises an elongated needle, wherein the needle comprises a hollow tube having a free end, and wherein the needle has a thickness that is
10 smaller than 20 gauge;

releasing a substance into the egg via the needle;

retracting the injection device from the egg;
15 and

applying a sanitizing fluid to the needle to kill pathogens attached thereto.

2. The method of Claim 1, wherein the
20 sanitizing fluid is applied to substantially the entire surface of the egg shell.

3. The method of Claim 1, wherein the free end is angled with respect to a longitudinal axis of the tube and has an opening surrounded by a planar,
25 peripheral surface.

4. The method of Claim 4, wherein the free end is angled between about thirty degrees and about
30 sixty degrees (30°-60°) with respect to the longitudinal axis of the tube.

5. The method of Claim 4, wherein the free end is angled by about forty-five degrees (45°) with respect to the longitudinal axis of the tube.

5 6. The method of Claim 1, wherein forming an opening in the shell comprises forming the opening with a tubular punch, and wherein inserting an injection device through the opening comprises moving the elongated needle through the tubular punch and then through the opening
10 formed in the shell.

7. The method of Claim 6, wherein the sanitizing fluid is applied to internal and external portions of the tubular punch.
15

8. The method of Claim 1, wherein the needle has a thickness that is smaller than 20 gauge.

9. The method of Claim 7, wherein the tubular
20 punch has an internal bore, and wherein a cross-sectional area of the elongated needle is less than or equal to forty percent (40%) of a cross-sectional area of the internal bore of the tubular punch.

25 10. The method of Claim 7, wherein the tubular punch has an internal bore that defines an internal volume, and wherein a volume displaced by the elongated needle is less than or equal to forty percent (40%) of the internal volume of the tubular punch.

30 11. The method of Claim 1, wherein the step of applying a sanitizing fluid to the shell of the egg is preceded by removing the egg from an incubator.

35 12. A method of introducing a substance into an avian egg, comprising:

removing an avian egg from an incubator,
wherein the egg contains a live avian embryo;

applying a sanitizing fluid to substantially
the entire surface of the shell of the egg to kill
5 pathogens attached thereto;

forming an opening in the shell;

inserting an injection device through the
opening and into an interior portion of the egg, wherein
the injection device comprises an elongated needle,
10 wherein the needle comprises a hollow tube having a free
end that is angled with respect to a longitudinal axis of
the tube, wherein the free end has an opening surrounded
by a planar, peripheral surface, wherein the free end is
angled between about thirty degrees and about sixty
15 degrees (30° - 60°) with respect to the longitudinal axis
of the tube, and wherein the needle has a thickness that
is equal to or smaller than 20 gauge;

releasing a substance into the egg via the
needle;

20 retracting the injection device from the egg;
and

applying a sanitizing fluid to the needle to
kill pathogens attached thereto.

25 13. The method of Claim 12, wherein the free
end is angled by forty-five degrees (45°) with respect to
the longitudinal axis of the tube.

14. The method of Claim 12, wherein forming
30 an opening in the shell comprises forming the opening
with a tubular punch, and wherein inserting an injection
device through the opening comprises moving the
elongated needle through the tubular punch and then
through the opening formed in the shell.

15. The method of Claim 14, wherein the sanitizing fluid is applied to internal and external portions of the tubular punch.

5 16. The method of Claim 12, wherein the needle has a thickness that is smaller than 20 gauge.

10 17. The method of Claim 14, wherein the tubular punch has an internal bore, and wherein a cross-sectional area of the elongated needle is less than or equal to forty percent (40%) of a cross-sectional area of the internal bore of the tubular punch.

15 18. The method of Claim 14, wherein the tubular punch has an internal bore that defines an internal volume, and wherein a volume displaced by the elongated needle is less than or equal to forty percent (40%) of the internal volume of the tubular punch.

20